Name _____ Date Fall Semester Exam Study Guide Class _____

Study Guide Methods of Science

In your textbook, read about the methods of science.

Match the definition in Column A with the term in Column B.

Column A

_____ **1.** a procedure that tests a hypothesis by collecting information under controlled conditions

_____ **2.** in an experiment, the group that is the standard against which results are compared

_____ **3.** in an experiment, the group that is exposed to the factor being tested

_____ **4.** the factor that remains fixed in an experiment

_____ **5.** the condition being changed by the scientist

_____ **6.** the factor that results from or depends on changes to the independent variable

_____ **7.** information gained from observation

_____ **8.** a testable explanation of a situation

Column B

A. constant

B. experimental group

C. independent variable

D. experiment

E. control group

F. dependent variable

G. hypothesis

H. data

In your textbook, read about data gathering.

Complete the table by checking the correct column(s) for each description.

Description	Quantitative Research	Qualitative Research
9. Numerical data		
10. Field study of hunting behavior		
11. Thermometer, balance scale, stopwatch		
12. Testable hypothesis		
13. Measurements from controlled laboratory experiments		
14. Purely observational data		
15. Binoculars, tape recorder, camera		
16. Calculations, graphs, and charts		

Name _____ Date _____ Class _____

Study Guide

CHAPTER 2
Section 1: Organisms and Their Relationships

In your textbook, read about ecology.

Read each statement. If it describes the study of ecology, write yes. *If not, write* no.

_____ **1.** Ecology is the study of interactions among organisms.

_____ **2.** Ecologists mainly study green plants.

_____ **3.** Most experiments in ecology are quick and done in a lab.

_____ **4.** Models help ecologists control the many variables in their studies.

In your textbook, read about the biosphere and levels of organization.

Match the definition in Column A with the term in Column B.

	Column A	Column B
_____	**5.** made up of individual organisms of the same species	**A.** abiotic factors
_____	**6.** all nonliving things in an environment	**B.** biosphere
_____	**7.** made up of the organisms and nonliving things in an area	**C.** biotic factors
_____	**8.** portion of Earth that supports life	**D.** ecosystem
_____	**9.** all living organisms in an environment	**E.** population

In your textbook, read about the ecosystem interactions and community interactions.

Complete the table by checking the correct column(s) for each interaction.

Interaction	Involves Abiotic Factors	Involves Biotic Factors
10. Commensalism		
11. Competition		
12. Habitat		
13. Mutualism		
14. Niche		
15. Predation		

Name _____ Date _____ Class _____

Study Guide

CHAPTER 2
Section 2: Flow of Energy in an Ecosystem

In your textbook, read about autotrophs and heterotrophs.

Match the definition in Column A with the term in Column B.

Column A	Column B
_____ **1.** get energy by eating other organisms	**A.** autotrophs
_____ **2.** eat both plants and animals	**B.** carnivores
_____ **3.** eat only animals	**C.** detritivores
_____ **4.** collect energy to produce their own food	**D.** herbivores
_____ **5.** eat only plants	**E.** heterotrophs
_____ **6.** eat or break down dead things	**F.** omnivores

In your textbook, read about models of energy flow.

Label the food chain below to identify each trophic level. Use these choices:

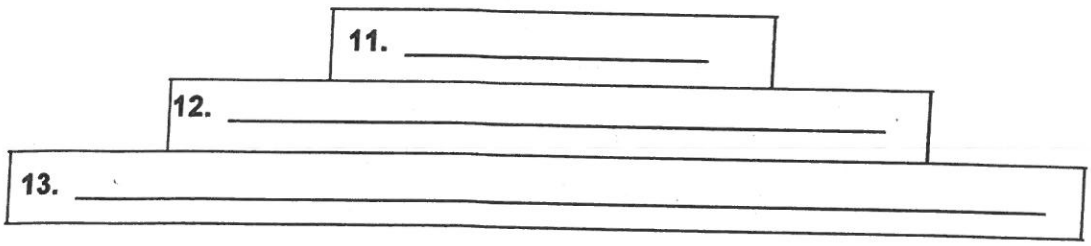
carnivore **herbivore** **omnivore** **producer**

GRASS → **GRASSHOPPER** → **RACCOON** → **COYOTE**

7. _____ **8.** _____ **9.** _____ **10.** _____

Label the ecological pyramid. Use these choices:

primary consumers **producers** **secondary consumers**



Respond to each statement.

14. Recall the name for the total amount of living matter in each trophic level of an ecological pyramid.

_____

15. Explain why an ecological pyramid is smaller at the top than at the bottom.

_____

Name _____ Date _____ Class _____

Study Guide

CHAPTER 2
Section 3: Cycling of Matter

In your textbook, read about the water cycle.

Number the steps of the water cycle in the order in which they occur. Begin with the collection of water in lakes or oceans.

_____ **1.** Groundwater and runoff from land surfaces flow into rivers, lakes, and oceans.

_____ **2.** Water returns to Earth as rain or snow through the process of precipitation.

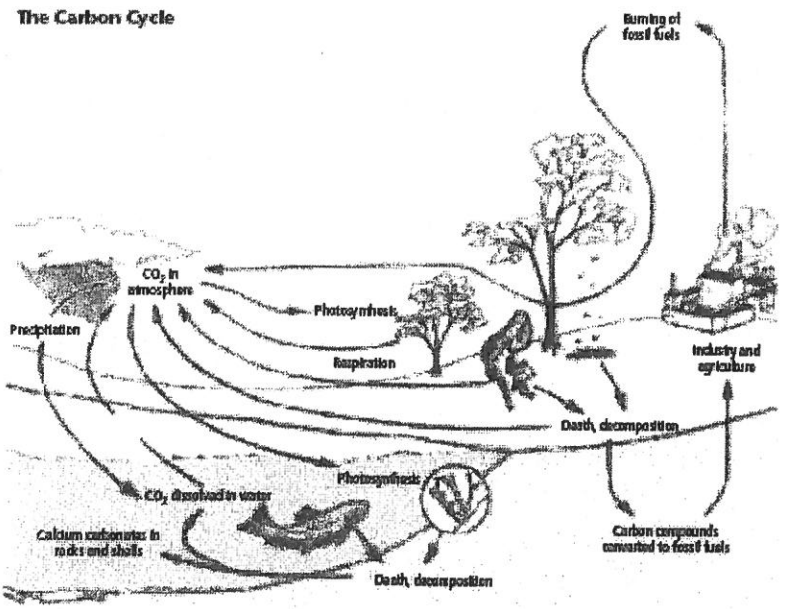
_____ **3.** Through evaporation, water changes from a liquid to a gas that becomes part of the air.

_____ **4.** Through condensation, water in the air changes from a gas to tiny droplets of liquid.

In your textbook, read about the carbon and oxygen cycles.

Refer to the illustration. Use each of the terms below only once to complete the passage.

atmosphere	**carbon**	**cycles**	**water**
living organisms	**photosynthesis**	**respiration**	



(5) _____ is a part of all organic compounds, which make up living things. It **(6)** _____ through the environment due to the flow of energy in ecosystems. The carbon cycle is made of several processes, including **(7)** _____ and **(8)** _____. During these processes, carbon moves between its major reservoirs. These major reservoirs include the **(9)** _____, the **(10)** _____, and **(11)** _____.

In your textbook, read about the nitrogen cycle.

Use each of the terms below only once to complete the passage.

ammonia	**atmosphere**	**consumers**	**decay**	**decomposers**
denitrification	**nitrogen fixation**	**plants**	**proteins**	**urinate**

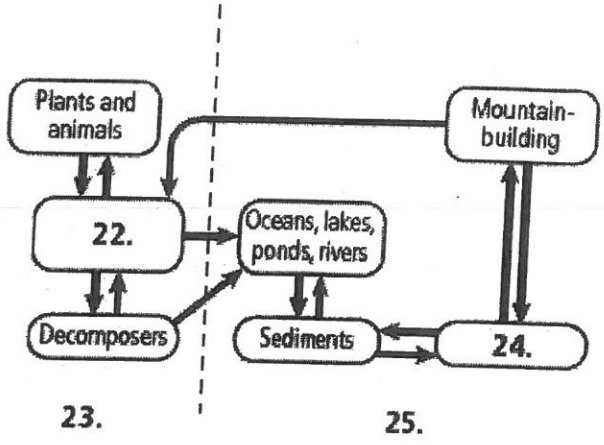
Nitrogen is a nutrient that organisms need to produce **(12)** _____. Plants and animals cannot use the nitrogen that makes up a large percentage of the **(13)** _____. The nitrogen is captured and converted into a form that is usable by plants in a process called **(14)** _____. Nitrogen enters the food web when **(15)** _____ absorb nitrogen compounds from the soil and use them to make proteins. **(16)** _____ get nitrogen by eating plants or animals that contain nitrogen. Nitrogen is returned to the soil when animals **(17)** _____ or when organisms die and **(18)** _____. **(19)**_____ break down organic matter found in organisms into **(20)** _____. This compound is changed by organisms in the soil into other nitrogen compounds that can be used by plants. Finally, some soil bacteria convert nitrogen compounds into nitrogen gas, which returns to the atmosphere in a process called **(21)** _____.

In your textbook, read about the phosphorus cycle.

Label the diagram of the phosphorus cycle. Use these choices:

long-term cycle	**new rock**	**short-term cycle**	**soil and groundwater**

22. _____
23. _____
24. _____
25. _____



Name _____ Date _____ Class _____

Study Guide Community Ecology

In your textbook, read about limiting factors.

Complete the table by checking the correct column(s) for each limiting factor.

Limiting Factor	Abiotic Factor	Biotic Factor
1. Temperature		
2. Rainfall		
3. Predator		
4. Soil chemistry		
5. Prey		
6. Plant nutrients		
7. Oxygen		
8. Sunlight		
9. Climate		
10. Producers		

In your textbook, read about ecological succession.

Use each of the terms below only once to complete the passage.

abiotic factors	**climax community**	**ecological succession**
ecosystems	**fire**	**lava flow**
pioneer species	**primary succession**	**secondary succession**

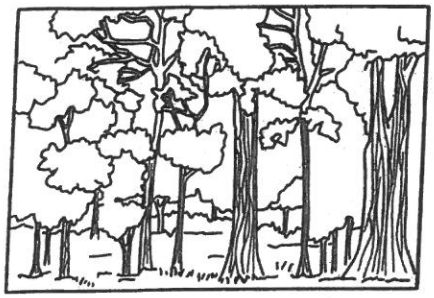
(11) _____ are constantly changing. Both **(12)** _____ and biotic factors change in every ecosystem. One type of ecosystem change, called **(13)** _____, results in one community replacing another over time. This process might begin on bare rock, such as a(n) **(14)** _____. The process begins when **(15)** _____ begin living on the rock. This process is called **(16)** _____. The mature community that eventually forms is called the **(17)** _____. Sometimes that community is destroyed by a(n) **(18)** _____. A new community will replace the destroyed one through the process of **(19)** _____.

Name _____ Date _____ Class _____

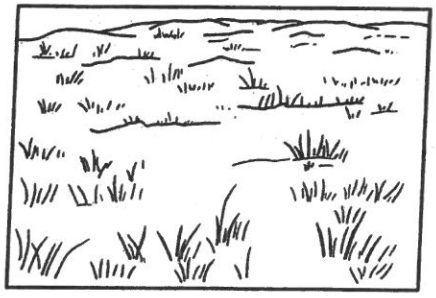
Study Guide, Community Ecology *CONTINUED*

In your textbook, read about primary succession.

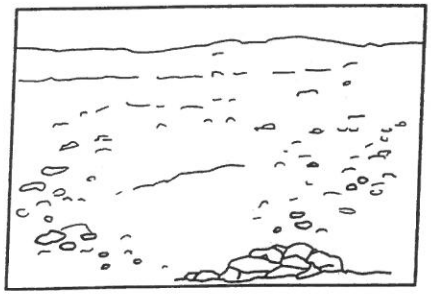
Number the pictures below in the order in which they occur, showing the changes that take place during primary succession.



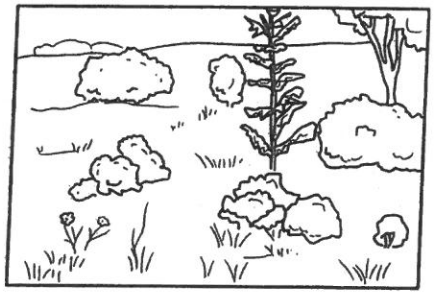
20. _____



22. _____



21. _____



23. _____

In your textbook, read about ecological succession.

Respond to each statement.

24. Name the material that is present for secondary succession that is not present for primary succession.

_____

25. Cite two reasons why secondary succession is faster than primary succession.

_____

_____

_____

26. Recall the name for the mature community that develops in secondary succession.

_____

Name _____ Date _____ Class _____

Study Guide

CHAPTER 4
Section 1: Population Dynamics

In your textbook, read about population characteristics.

Use each of the terms below only once to complete the passage.

carrying capacity	**density dependent**	**density independent**	**growth rate**
population density	**randomly**	**dispersion**	

Some characteristics that all populations have include **(1)** _____, **(2)** _____, and **(3)** _____. Populations tend to be dispersed **(4)** _____, uniformly, and in clumps. Populations also tend to stabilize near the **(5)** _____ of their environment. Factors that limit populations are either **(6)** _____ or **(7)** _____.

In your textbook, read about population-limiting factors.

Complete the table by checking the correct column(s) for each description.

Description	Density Dependent	Density Independent
8. Earthquake-related tsunami		
9. Intense competition for a food source		
10. Influenza epidemic		
11. Flooding due to a hurricane		
12. Change in the number of predators		

If the statement is true, write true. *If the statement is false, replace the italicized term or phrase to make it true.*

13. *Population-limiting factors* keep a population from increasing indefinitely.

_____

14. *Density-independent factors* include parasites and disease.

_____

15. On Isle Royale, the population of moose decreased as the population of wolves *decreased.*

_____

16. Competition can occur *within a species or between two different species.*

_____

In your textbook, read about population growth rate.

Figure 1

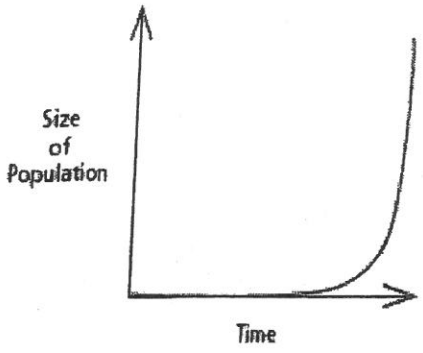
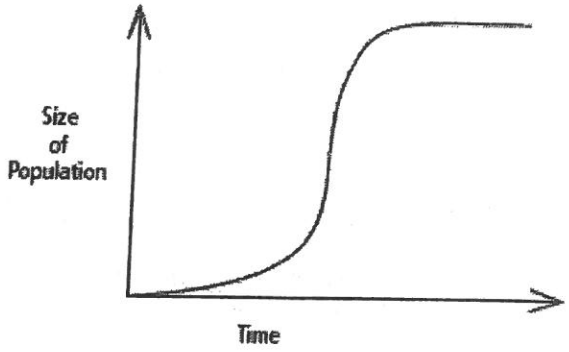


Figure 2



Refer to ***Figures*** *1 and 2. Respond to each statement.*

17. **Identify** the type of growth rate demonstrated in **Figure 1**.

_____

18. **Identify** the type of growth rate demonstrated in **Figure 2**.

_____

19. **Tell** which type of growth rate comes first.

_____

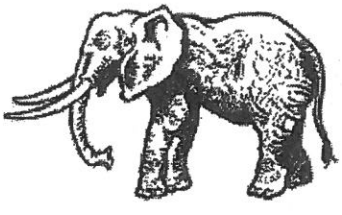
In your textbook, read about reproductive patterns.

Identify the following as being either an r*-strategist or a* k*-strategist.*

20. _____

22. _____

21. _____



23. _____

Name _____ Date _____ Class _____

Study Guide

CHAPTER 4
Section 2: Human Population

In your textbook, read about human population.

Match the definition in Column A with the term in Column B.

Column A

_____ **1.** when the birthrate equals the death rate

_____ **2.** the change in a population from high birthrate and death rate to low birthrate and death rate

_____ **3.** the number of males and females in each of three groups

_____ **4.** the study of the size, distribution, density, movement, death rate, and birthrate of a human population

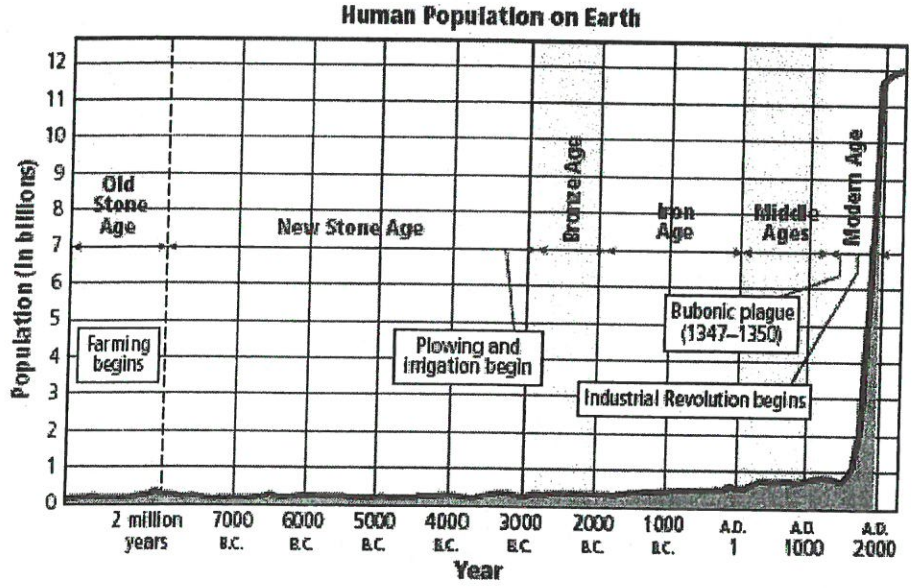
Column B

A. demography

B. demographic transition

C. age structure

D. zero population growth



In your textbook, read about human population growth.

Refer to the figure. Respond to each statement.

5. Find the world's population in A.D. 1000. **Find** the world's population in A.D. 2000.

_____

6. State approximately when the Industrial Revolution began. **Tell** what effect the Industrial Revolution had on the human population on Earth.

_____

7. Specify if the human population growth graph up until A.D. 2000 is exponential or logistic.

_____

In your textbook, read about trends in human population growth.

If the statement is true, write true. *If the statement is false, replace the italicized word or phrase to make it true.*

8. Industrially developed countries generally have *high* population growth rates.

_____

9. If Honduras were to experience a low birthrate and death rate in the next five years, it would be undergoing a *demographic transition.*

_____

10. Once the world reaches zero population growth, the *age structure* will be more balanced.

_____

11. Technology has allowed humans to temporarily increase the *carrying capacity* of Earth.

_____

12. People in industrially developed countries use a lot *fewer* resources than people in developing countries.

_____

In your textbook, read about age structure.

Complete the table by checking the correct column(s) for each example.

Example	Pre-reproductive	Reproductive	Post-reproductive
13. An 11-year-old boy			
14. A 65-year-old grandmother			
15. A 25-year-old man			
16. A newborn baby girl			
17. A 78-year-old man			
18. A 32-year-old woman			

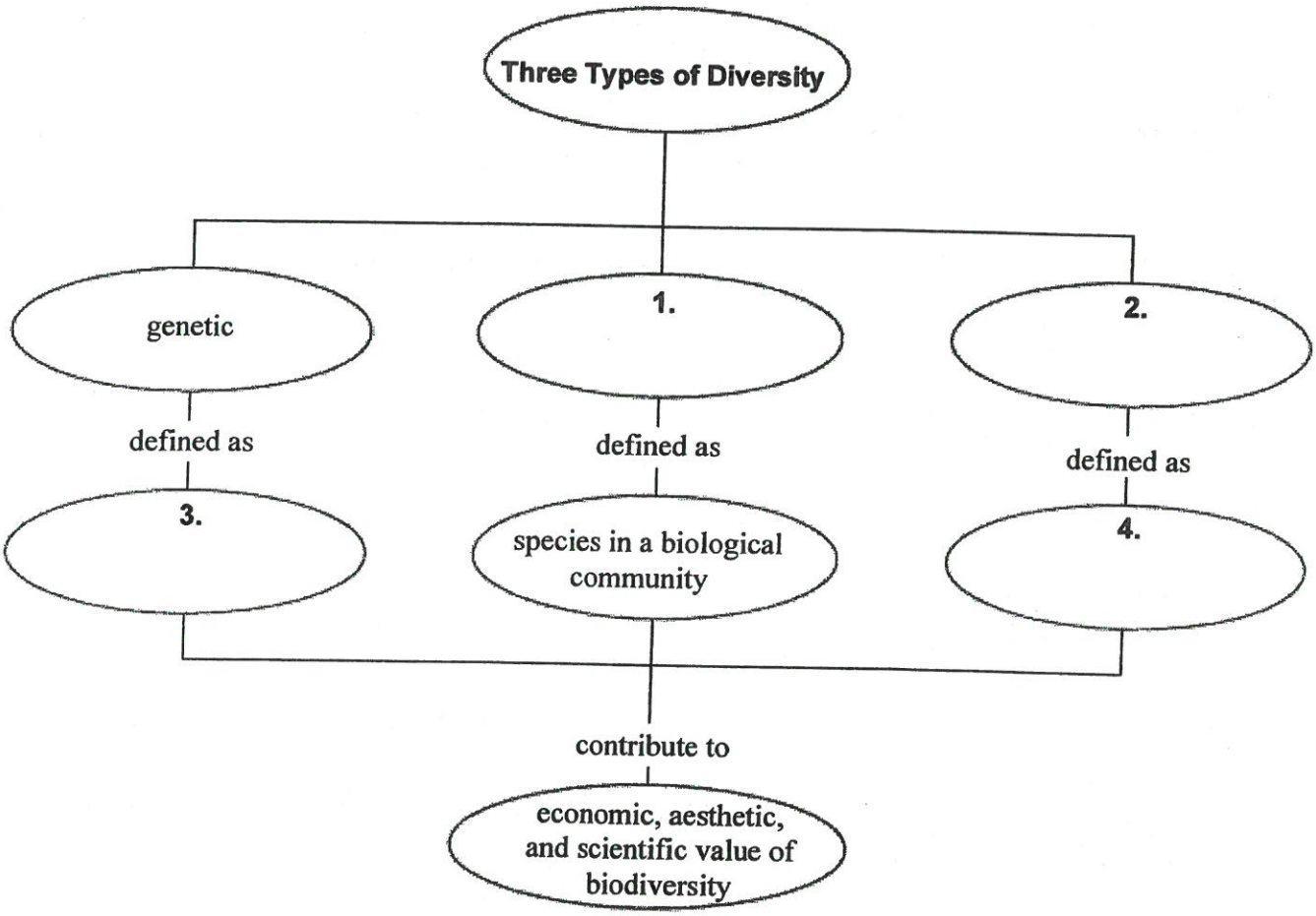
Name _____ Date _____ Class _____

Study Guide

CHAPTER 5
Section 1: Biodiversity

In your textbook, read about biodiversity.

Complete the graphic organizer. These terms may be used more than once: biodiversity, ecosystem, species, variety of ecosystems present, variety of genes in a population.



Use each of the terms below only once to complete the passage.

biodiversity	**drinking water**	**food crops**	**genes**
medicines	**nutrients**	**species**	

Maintaining **(5)** _____ is important for many reasons. Humans need to preserve the specific **(6)** _____ they use directly. Species that are used indirectly are valuable because they are a source of **(7)** _____ that might be needed in the future, which is important for **(8)** _____. In addition, organisms that are not yet identified might provide **(9)** _____. The indirect benefits of a healthy biosphere include cycling of **(10)** _____ and provision of safe **(11)**_____.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 5
Section 2: Threats to Biodiversity

In your textbook, read about threats to biodiversity.

For each statement below, write true *or* false.

_____ **1.** The current rate of extinction is decreasing significantly.

_____ **2.** Island species are especially vulnerable to extinction.

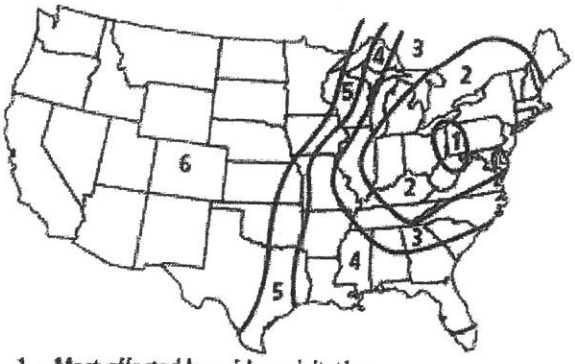
_____ **3.** Only a few factors threaten biodiversity.

_____ **4.** The primary cause of extinction is loss of habitat.

_____ **5.** Introduced species make biodiversity stronger and more stable.

In your textbook, read about acid precipitation.

Refer to the map of the United States and the key. Respond to each statement.



1 = Most affected by acid precipitation
6 = Least affected by acid precipitation

6. Identify the area of the United States that receives the most acid precipitation.

_____

7. Locate your state on the map. **Determine** how affected your state is by acid precipitation.

_____

_____

8. Define *acid precipitation*. **Explain** the problems it causes for the environment.

_____

_____

_____

_____

In your textbook, read about factors that threaten biodiversity.

Complete the table by filling in the missing information.

Threat to Biodiversity	Description	Example of a Threatened Species or Organism
Overexploitation	**9.**	bison
Destruction of habitat	**10.**	hyacinth macaw
Disruption of habitat	**11.**	**12.**
Fragmentation of habitat	**13.**	Florida panther
Pollution of habitat	**14.**	**15.**
Acid precipitation	**16.**	Blue Ridge goldenrod
Eutrophication	**17.**	water pennywort
Introduced species	**18.**	Guam rail

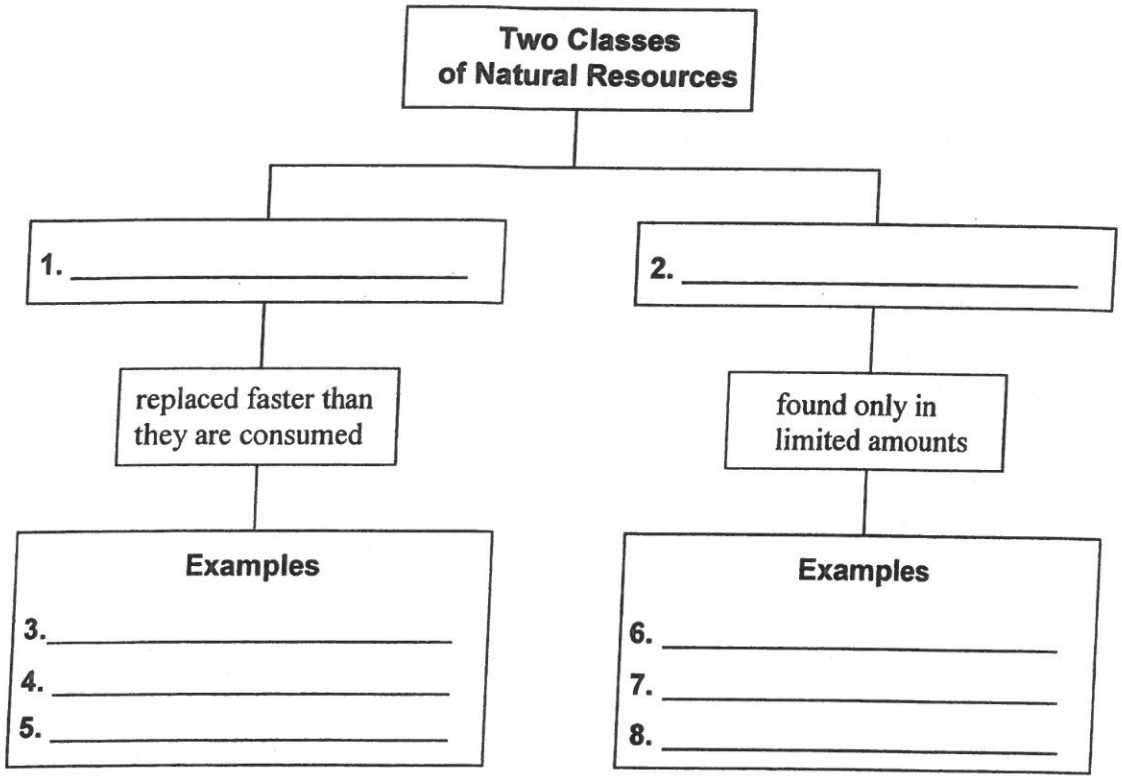
Name _____ Date _____ Class _____

Study Guide

CHAPTER 5
Section 3: Conserving Biodiversity

In your textbook, read about natural resources.

Complete the graphic organizer. These terms may be used more than once: animals, fossil fuels, mineral deposits, nonrenewable resources, plants, radioactive uranium, renewable resources, solar energy.



In your textbook, read about restoring ecosystems.

Respond to the following statement.

9. Define *bioremediation* and *bioaugmentation.* Give one example of each.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____ Class _____

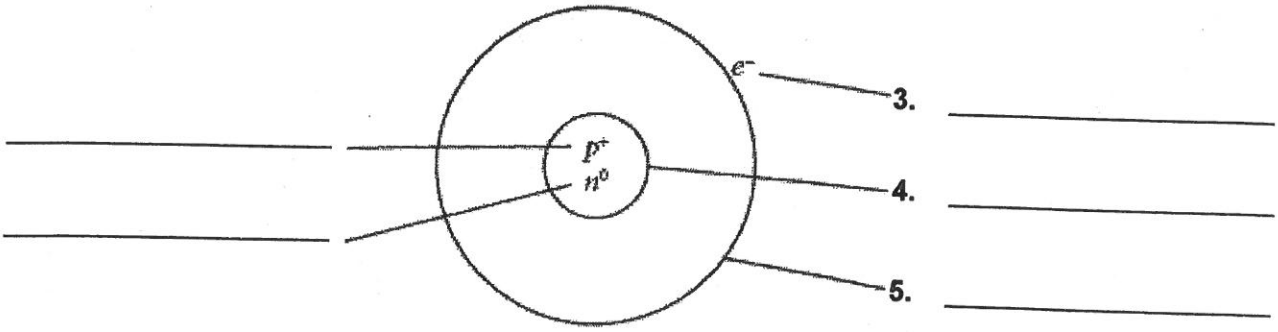
Study Guide

CHAPTER 6
Section 1: Atoms, Elements, and Compounds

In your textbook, read about the structure of atoms.

Label the diagram of an atom. Use these choices:

electron **energy level** **neutron** **nucleus** **proton**



In your textbook, read about elements, compounds, and chemical bonds.

If the statement is true, write true. *If the statement is false, replace the italicized term or phrase to make it true.*

6. On the periodic table, each element has a unique name and *formula.*

_____

7. The periodic table is organized into horizontal rows, called periods, and vertical columns, called *elements.*

_____

8. *Water* is composed of hydrogen and oxygen.

_____

9. Atoms of the same element that have different numbers of neutrons are called *isotopes.*

_____

10. The *period* of an element is the amount of time it takes for half of a radioactive isotope to decay.

_____

11. A *combination* is a substance formed when two or more different elements combine.

_____

12. The two main types of chemical bonds are *covalent bonds* and *van der Waals forces.*

_____

Name _____ Date _____ Class _____

Study Guide

CHAPTER 6
Section 2: Chemical Reactions

In your textbook, read about reactants and products.

Fill in the blanks with the correct number of molecules to balance the chemical equation.

$$C_6H_{12}O_6 + \underset{(1)}{\_\_\_\_}\ O_2 \longrightarrow \underset{(2)}{\_\_\_\_}\ CO_2 + \underset{(3)}{\_\_\_\_}\ H_2O$$

Respond to each statement.

4. **State** the principle that explains why there must be the same number of atoms of each element on each side of an equation.

_____

_____

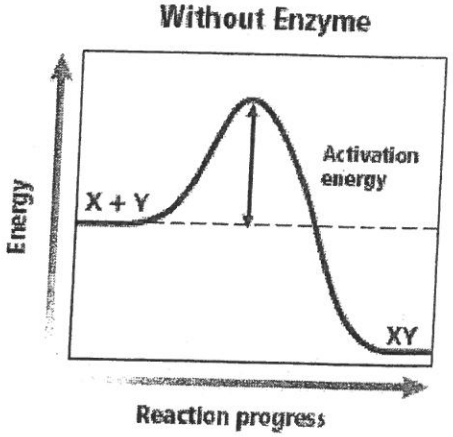
5. **Identify** which number indicates the number of atoms of each element in a molecule of a substance.

_____

In your textbook, read about activation energy and enzymes.

Refer to the graph of the reaction pathway.

6. Draw a line on the graph that approximates the reaction pathway if an enzyme is added to the reactants.



Match the description in Column A with the term in Column B.

Column A		Column B
_____	7. minimum amount of energy required for reactants to form products	A. enzyme
_____	8. substance that lowers energy needed to start a chemical reaction	B. substrate
_____	9. protein that is a biological catalyst	C. activation energy
_____	10. molecule that binds to an enzyme	D. catalyst

Name _____ Date _____ Class _____

Study Guide

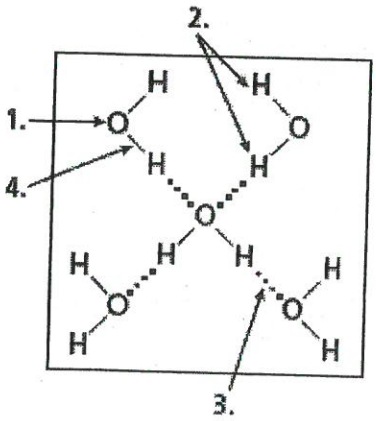
CHAPTER 6
Section 3: Water and Solutions

In your textbook, read about water's polarity.

Label the diagram. Use these choices:

covalent bond **hydrogen bond** **slightly negative end** **slightly positive end**

1. _____
2. _____
3. _____
4. _____



In your textbook, read about mixtures with water.

For each statement below, write true *or* false.

_____ **5.** A mixture is a combination of two or more substances in which each substance retains its individual characteristics.

_____ **6.** A suspension is a mixture that has a uniform composition throughout.

_____ **7.** In a mixture, the solvent is the substance that is dissolved.

_____ **8.** A mixture of sand and water is a heterogeneous mixture.

_____ **9.** A suspension is a homogeneous mixture in which water is mixed with a substance that does not dissolve in it.

In your textbook, read about acids and bases.

Use each of the terms below only once to complete the passage.

acids **bases** **biology** **buffers** **hydrogen ions** **neutral** **pH**

Substances that release hydrogen ions when dissolved in water are called **(10)** _____. The more **(11)** _____ a substance releases, the more acidic the solution becomes. Substances that release hydroxide ions when dissolved in water are called **(12)** _____. Acids and bases are key substances in **(13)** _____. The concentration of hydrogen ions in a solution is called **(14)** _____. Pure water is **(15)** _____ and has a pH value of 7.0. **(16)** _____ are weak acids or weak bases that can react with strong acids or strong bases to keep the pH within a particular range.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 6
Section 4: The Building Blocks of Life

In your textbook, read about the building blocks of life.

For each statement below, write true *or* false.

_____ **1.** Carbon atoms can bond together in straight chains, branched chains, or rings.

_____ **2.** Large molecules containing carbon atoms are called micromolecules.

_____ **3.** Polymers are molecules made from repeating units of identical organic compounds that are linked together by hydrogen bonds.

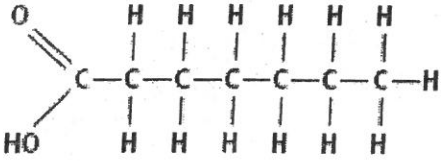
_____ **4.** Carbon is a component of almost all biological substances.

_____ **5.** Macromolecules can be organized into vitamins, lipids, proteins, and nucleic acids.

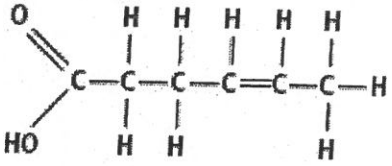
In your textbook, read about carbohydrates, lipids, proteins, and nucleic acids.

Label the diagrams. Use these choices: saturated fat, unsaturated fat.

6. _____



7. _____



Complete the table by checking the correct column(s) for each description.

Description	Carbohydrate	Lipid	Protein	Nucleic Acid
8. Stores coded genetic information				
9. Makes up fats, oils, and waxes in biology				
10. Makes up muscles, skin, and hair				
11. Forms double-helix structures				
12. Is made of amino acids				
13. Includes glucose, lactose, sucrose, and glycogen				
14. Stores energy and is part of membranes				
15. Contains peptide bonds				

19.
20.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 7
Section 1: Cell Discovery and Theory

In your textbook, read about the history of the cell theory and microscope technology.

Respond to each statement.

1. **Name** the invention that helped scientists discover the cell.

_____

2. **Tell** why Hooke called the structures he saw in the cork *cellulae* ("small rooms").

_____

_____

3. **Name** the type of microscope that uses a series of magnifying lenses.

_____

Write the term or phrase that best completes each statement. Use these choices:

cell theory **cells** **daughter cells** **genetic material** **organisms**

The **(4)** _____ includes the following three principles:

1. All living organisms are composed of one or more **(5)** _____.
2. Cells are the basic unit of structure and organization of all living **(6)** _____.
3. Cells arise only from previously existing cells, with cells passing copies of their **(7)** _____ on to their **(8)** _____.

In your textbook, read about basic cell types.

Complete the table by checking the correct column(s) for each description.

Description	Prokaryotes	Eukaryotes
9. Organisms that break down molecules to generate energy		
10. Organisms that have cells lacking internal membrane-bound organelles		
11. Organisms whose cells do not have nuclei		
12. Organisms that are either unicellular or multicellular		
13. Organisms that are generally unicellular		
14. Organisms that have cells containing organelles		
15. Organisms that have plasma membranes		

Name _____ Date _____ Class _____

Study Guide

CHAPTER 7
Section 2: The Plasma Membrane

In your textbook, read about the function of the plasma membrane.

Complete the table by checking the correct column(s) for each description.

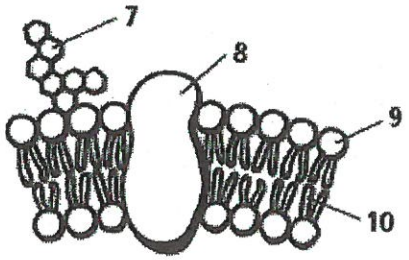
Description	Selective Permeability	Homeostasis	Plasma Membrane
1. The process of maintaining balance inside a cell			
2. A boundary between a cell and its environment			
3. The feature of the plasma membrane that keeps some substances out			
4. Separates prokaryotic and eukaryotic cells from the watery environment in which they exist			
5. The quality of a plasma membrane that allows oxygen and glucose to move in			
6. Maintained by the plasma membrane			

In your textbook, read about the structure of the plasma membrane.

Label the diagram of the plasma membrane. Use these choices:

carbohydrate chain **nonpolar tails** **polar head** **transport protein**

7. _____
8. _____
9. _____
10. _____



Match the definition or description in Column A with the term in Column B.

Column A

_____ **11.** make up most of the molecules in the plasma membrane

_____ **12.** a molecule that has a glycerol backbone, two fatty acid chains, and a phosphate-containing compound

_____ **13.** move substances through the plasma membrane

_____ **14.** two layers of phospholipids arranged tail-to-tail

_____ **15.** the phospholipid "sea" in which embedded substances float

Column B

A. transport proteins

B. lipids

C. phospholipid

D. fluid mosaic model

E. phospholipid bilayer

Name _____ Date _____ Class _____

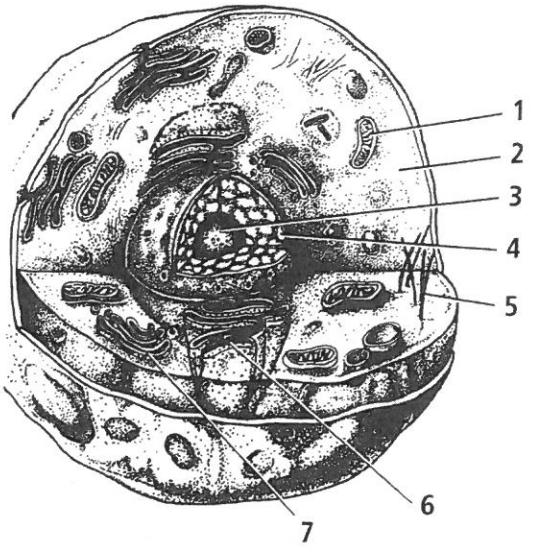
Study Guide Structures and Organelles

In your textbook, read about structures and organelles.

Label the diagram of a typical animal cell. Use these choices.

cytoplasm **endoplasmic reticulum** **Golgi apparatus** **microtubules**
mitochondrion **nucleolus** **nucleus**

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____



If the statement is true, write true. If the statement is false, replace the italicized word or phrase to make it true.

8. Microtubules are long, hollow protein cylinders that form *a rigid skeleton for the cell.*

_____

9. The *Golgi apparatus* contains most of the cell's DNA.

_____

10. The nucleolus is the structure that produces *sugars.*

_____

11. The *endoplasmic reticulum* is a stack of membranes that packages proteins into sacs called vesicles.

_____

12. The *cytoplasm* is the semifluid internal environment of the cell.

_____

Name _____ Date _____ Class _____

Study Guide Cellular Transport

In your textbook, read about cellular transport.

Match the definition in Column A with the term in Column B.

Column A

_____ **1.** moves small molecules across the plasma membrane using transport proteins

_____ **2.** involves water moving across the plasma membrane to the side with the greater solute concentration

_____ **3.** occurs when substances move against the concentration gradient; requires energy and the aid of carrier proteins

_____ **4.** occurs when the plasma membrane surrounds a large substance inside the cell and moves it outside the cell

_____ **5.** the condition that results when diffusion continues until the concentrations are the same in all areas

_____ **6.** occurs when the plasma membrane surrounds a large substance outside the cell and moves it inside the cell

Column B

A. osmosis

B. exocytosis

C. facilitated diffusion

D. dynamic equilibrium

E. active transport

F. endocytosis

In your textbook, read about osmosis.

Complete the table by checking the correct column(s) for each description.

Description	Isotonic Solution	Hypotonic Solution	Hypertonic Solution
7. A solution that has the same osmotic concentration as a cell's cytoplasm			
8. A solution that causes a cell to shrivel			
9. A solution that causes a cell to swell			
10. A solution that neither shrinks nor swells a cell			
11. A solution in which there is more water outside the cell than inside the cell			
12. A solution that causes water to move out of a cell			

Name _____ Date _____ Class _____

Study Guide

CHAPTER 8

Section 1: How Organisms Obtain Energy

In your textbook, read about how organisms obtain energy.

Match the definition in Column A with the term in Column B.

	Column A	Column B
_____	**1.** the idea that energy cannot be created or destroyed	**A.** energy
_____	**2.** all the chemical reactions in a cell	**B.** thermodynamics
_____	**3.** anabolic pathway that converts energy from the Sun to chemical energy for use by cells	**C.** first law of thermodynamics
_____	**4.** ability to do work	**D.** second law of thermodynamics
_____	**5.** series of chemical reactions in which the product of one reaction is the substrate for the next reaction	**E.** metabolism
_____	**6.** biological molecule that provides chemical energy	**F.** photosynthesis
_____	**7.** study of the flow and transformation of energy	**G.** cellular respiration
_____	**8.** source of nearly all energy for life	**H.** metabolic pathway
_____	**9.** catabolic pathway that breaks down organic molecules	**I.** adenosine triphosphate (ATP)
_____	**10.** spontaneous increase in disorder, or entropy	**J.** sunlight

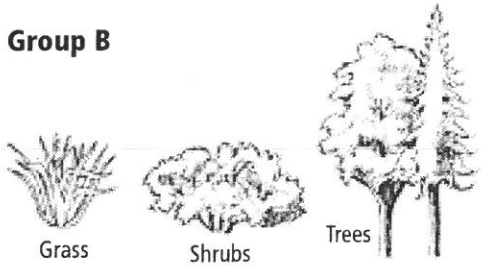
In your textbook, read about autotrophs and heterotrophs.

Refer to the illustrations. Use each of the terms below only once to complete the passage.

autotrophs **chemoautotrophs** **Group A** **Group B** **heterotrophs**

Group A

Group B



The group that makes their own food is **(11)** _____. The organisms in this group are called **(12)** _____. The group that must eat other organisms for food is **(13)** _____. The organisms in this group are called **(14)** _____. Some organisms get their energy from inorganic substances, such as hydrogen sulfide. These organisms are called **(15)** _____.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 8

Section 2: Photosynthesis

In your textbook, read about light reactions.

Number the following steps of light reactions in the order in which they occur.

_____ **1.** The energy lost by electrons as they pass through the electron transport chain is used to make ATP.

_____ **2.** The electrons pass from the chlorophyll to an electron transport chain.

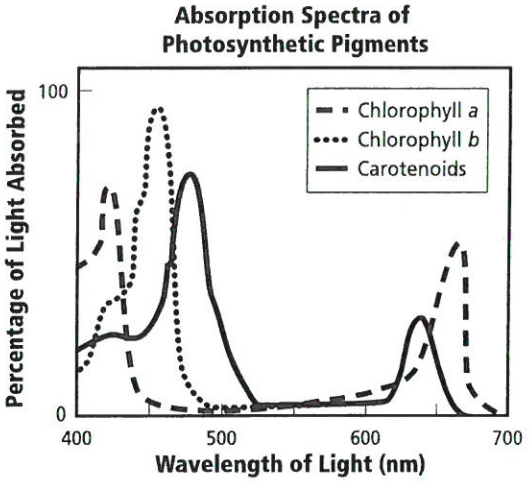
_____ **3.** Sunlight strikes the chlorophyll molecules in the thylakoid membranes.

_____ **4.** $NADP^+$ molecules change to NADPH as they carry the electrons to the stroma of the chloroplast.

_____ **5.** Light energy is transferred to the chlorophyll's electrons.

_____ **6.** The electrons are passed down a second electron transport chain.

Refer to the graph. Respond to each statement.



7. Explain why there are usually several types of pigments present in chloroplasts.

_____

_____

_____

_____

_____

8. State the name of the pigment that absorbs the most light at about 450 nm. _____

In your textbook, read about the Calvin cycle and alternative photosynthesis pathways.

Complete the table by checking the correct column(s) for each description.

Description	Calvin	C_4	CAM
9. The second phase of photosynthesis, in which energy is stored in glucose			
10. Pathway(s) that help(s) plants photosynthesize while minimizing water loss			
11. Pathway that allows carbon dioxide to enter leaves only at night			
12. Light-independent reactions			
13. Uses the enzyme rubisco to convert carbon dioxide into molecules that can be used by the cell			
14. Type of plant found in hot, dry environments			

Name _____ Date _____ Class _____

Study Guide

CHAPTER 8

Section 3: Cellular Respiration

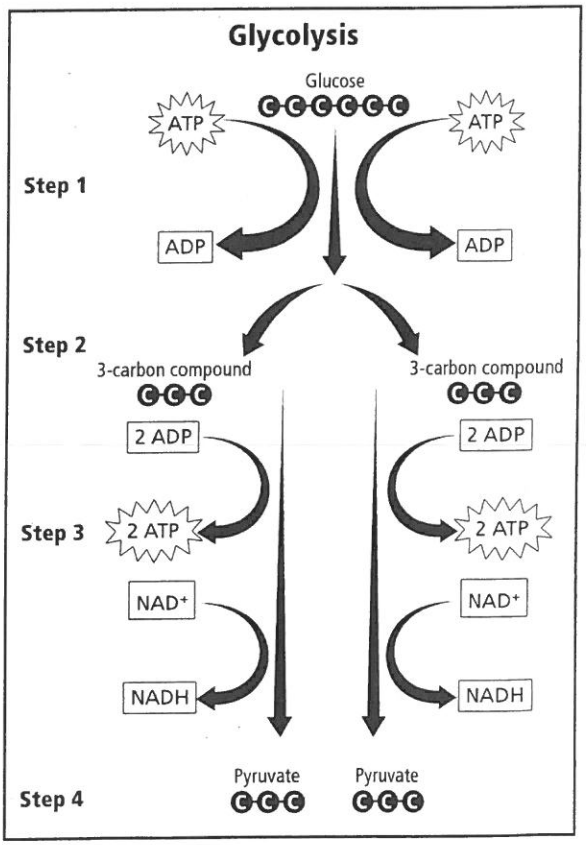
In your textbook, read about cellular respiration and glycolysis.

Use each of the terms below only once to complete the passage.

aerobic	**anaerobic**	**ATP**	**cellular respiration**	**cytoplasm**	**energy**
glucose	**glycolysis**	**mitochondria**	**NADH**	**oxygen**	

Organisms obtain energy in a process called **(1)** _____. This process harvests electrons from carbon compounds, such as **(2)** _____, and uses that energy to make **(3)** _____. ATP is used to provide **(4)** _____ for cells to do work. In **(5)** _____, glucose is broken down into pyruvate. Glycolysis is a(n) **(6)** _____ process because it does not require oxygen. Glycolysis takes place in the **(7)** _____. Two molecules of ATP and two molecules of **(8)** _____ are formed for every glucose molecule that is broken down. **(9)** _____ respiration takes place in the **(10)** _____. It is aerobic because the process requires **(11)** _____.

Refer to the diagram of glycolysis. Label the steps in the description to match the diagram.



12. Step _____. Each three-carbon compound is converted into a three-carbon pyruvate.
13. Step _____. A six-carbon compound is broken down into two three-carbon compounds.
14. Step _____. Phosphate groups from two ATP molecules are transferred to a glucose molecule.
15. Step _____. Two NADH molecules and four ATP molecules are produced.

Respond to each question.

16. **Interpret** How many total ATP molecules are produced from the glycolysis of one six-carbon glucose?

_____

17. **Explain** Why is there a net gain of only two ATP molecules in the glycolysis of one six-carbon glucose?

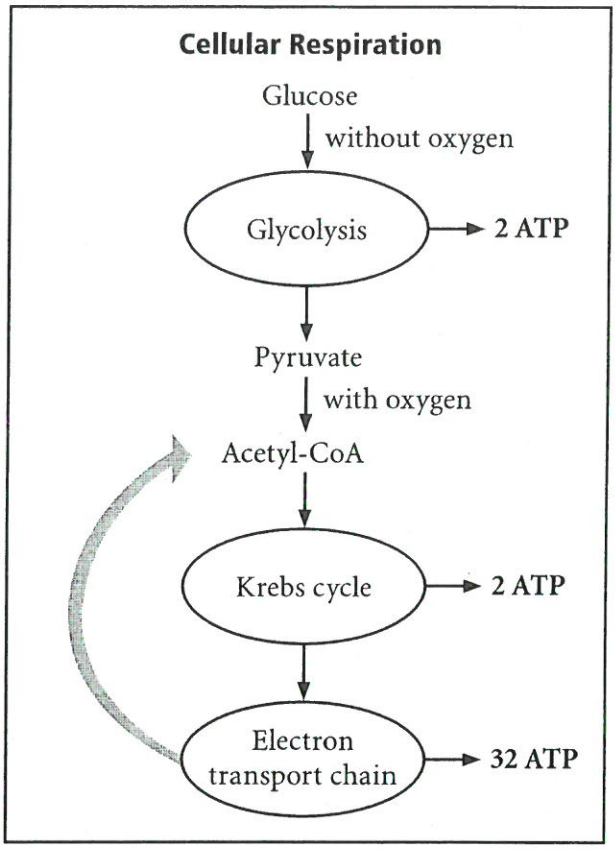
_____

_____

_____

In your textbook, read about the Krebs cycle, electron transport, and anaerobic respiration.

Refer to the diagram of cellular respiration. Respond to each question and statement.



18. Recall What is the net yield of ATP produced by each of the circled processes in the diagram?

Glycolysis = _____ ATP

Krebs cycle = _____ ATP

Electron transport chain = _____ ATP

19. Find the total net yield of ATP from one molecule of glucose.

_____

20. Specify Based on the diagram and your calculations, which process produces more energy—the anaerobic pathway or the aerobic pathway?

_____

For each statement below, write true *or* false.

_____ **21.** The anaerobic pathway that follows glycolysis in the absence of oxygen is fermentation.

_____ **22.** The hydrogen necessary in the electron transport chain comes from the splitting of carbon dioxide molecules.

_____ **23.** Cellular respiration in eukaryotes is slightly more efficient than in prokaryotes.

_____ **24.** The Krebs cycle is sometimes called the TCA cycle or the citric acid cycle.

_____ **25.** Fermentation occurs in the mitochondria.

_____ **26.** Skeletal muscle produces lactic acid when the body cannot supply enough oxygen.

_____ **27.** Alcohol fermentation is found in some bacteria and in humans.

_____ **28.** The two pyruvate molecules formed during glycolysis result in two Krebs cycles.

_____ **29.** Electron transport is the first step in the breakdown of glucose.